



PRIVATE INSURANCE AND INCOME INEQUALITY IN IRAN

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ABSTRACT

This study surveys the impact of private insurance on income distribution. For this purpose, the panel data of the Iran's provinces, during 2000 to 2012, has been used. The Provincial data has been gathered for 11 divided districts and the impact of private insurance as well as Inflation, unemployment and economic growth on the Gini coefficient has been tested by means of these data. As the dependency of districts has not been rejected by CD test result, data stationary has been tested by CIPS method and the SUR method has been used to evaluate the research model. Overall, this study indicates that the income inequality in Iran has been reduced by growth of private insurance.

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JEL Classification: G22, E21, E22.

Contribution/ Originality

The paper's primary contribution is finding that private insurance has effective role on reducing income inequality. This might be an evidence of risk sharing impact on income distribution in macro level if private insurance would be considered as a risk sharing mechanism.

1. INTRODUCTION

Health insurances and other government-sponsored insurances have been designed to reduce income inequality and support the poor strata of society. However, private insurances are not intended to reduce income inequality and they take shape as an individual contract with insurance companies to cover the risk of property and responsibility. Nonetheless, the question is: whether such insurances have any impact on the income distribution? Considering insurance role in risk transference and risk distribution among insured people, it seems probably it can reduce inequality

by means of risk distribution, though there are little evidences in this regard. Perhaps the lack of evidences is due to great penetration of private insurances in developed countries where tracking insurance's role in income distribution would be of no use.

However, insurance penetration in some countries, especially Islamic countries, is still limited due to their cultural and financial properties. For example Insurance penetration coefficient in Iran was very limited till 2002 because of some reasons which would be explained in third part of the paper. However, from 2002 onward, after Iranian constitution revision and removing legal problems, insurances companies could grow considerably faster and these companies' rapid growth was associated with greater penetration of private insurance. So, this period is an appropriate time for testing the hypothesis that whether income inequality can be influenced by private insurance? This paper aims to answer this question.

This paper is prepared in 5 chapters. The literature is covered in next chapter, though there is little literature about this subject. In 3rd chapter, Iran insurance status will be described and in 4th chapter the research model will be reiterated and the used variables would be specified in addition to introducing econometrics method of the research. Furthermore, the research model estimation and its result will be reported in 4th chapter. In 5th chapter, we will summarize the results and suggestions for further study.

2. LITERATURE REVIEW: INSURANCE AND INCOME INEQUALITY

Bonfiglioli (2012) mentioned that the division of risks via insurance would motivate greater number of investors to be entered into the production field. Thus, the investors with less risk acceptance would be inclined to invest, in case suitable mechanism of insurance would be available. He further indicated that this process will reduce the volatility of earnings and income inequality. Other studies such as Abrahamsen and Asche (2010) and Li and Liao (2014) also found similar results about the relationship between insurance and private investment.

Private insurance could be more effective on the income inequality, especially in underdeveloped countries which suffer from lack of suitable financial institution. People of the undeveloped countries, scarcely have access to the insurance due to low development level of cultural and financial system. In such countries, the impact of private insurance on the income inequality would be more significant in case of more access to insurance. Beck *et al.* (2007) shows that, inaccessibility of low income people to financial institutions is one of the influent factors on the income inequality. Hitherto, Elmi and Ariani (2011) reached the same conclusion through their study of the Middle East and North Africa. Furthermore, Laszo (2008) concluded from his study that risk has greater effect on low-income people in rural economies. Thus, they will be propelled to informal insurance considering that often there is not proper adequate insurance coverage. Skipper and Kwon (2007) also believe that in case of private insurance increment, especially life insurance, the need for social insurance in the country will be reduced. It is shown that social insurance can be partly replaced by private insurance which plays supporting roles for poor groups.

The Checchi and García-Peñalosa (2004) showed that a mechanism similar to insurance can contribute to human capital accumulation. They recognized inheritance as an insurance mechanism to reduce the risk of economic volatility. Based on their survey, It has been indicated that inheritance can be effective on human capital formation and educational improvement which lead to reduction of income inequality. Importantly, Checchi and García-Peñalosa (2004) shows that income inequality will increase in the risky conditions. This issue has been studied in different way by Caroli and García-Peñalosa (2002) and García-Peñalosa and Turnovsky (2005). The two studies also show that increase of economy risk would lead in income inequality increment. Huang *et al.* (2015), studied experimentally the hypothesis that increased economic volatility and risk would lead to income inequality intensification.

3. DATA

History of Iranian insurances has special characteristics. After Islamic revolution all insurance companies were nationalized with only one government-owned insurance company providing property and responsibility insurance services. In the year of 2002, after constitution amendment, private companies and banks have been permitted to take part in the insurance market. Although, since then, a large number of insurance companies have been emerged in the insurance market and the volume of insurance services has been noticeably increased, however still insurance penetration is low in Iran economy. On the other hand, automobile insurance makes up a significant share of insurance turnover in Iran. According to Islamic laws, if the driver hit a pedestrian by accident (whether deliberately or not), he expected to pay his blood money which is significant in comparison with average income of household. Because of driver's financial inability to cover damages and injuries, they were put to jail during previous years. Also, car private insurance for drivers found to be almost mandatory that allowed police to stop the cars which do not have insurance. This caused insurance penetration rate to be increased in recent years. But, in case of insurance coverage, they should have not been in jail. It should be noted here that the accident rate in Iran is higher than worldwide average rate.

Iran consists of several parts that each have their own culture and language. Iran is divided into 32 provinces, which in this study we divided them into 11 main districts. Economic and cultural conditions in each region are somewhat the same.

The data used in this paper consists of 11 districts of Iran during the years 2000 to 2012. This includes all information available for the aforementioned districts. The sequence of districts correlated to the degree of development and per capita income. Similarly, unemployment rate in higher category districts is less than other ones. Data used in this research include following indexes:

Economic growth of the districts is on the basis of real GDP per Capita (identified with GR). Inflation is calculated on the basis of provincial CPI (identified with *P*). Unemployment rate of every province was obtained from bulletins of statistical center of Iran (identified with *UE*). Insurance penetration was taken from 2006 and 2014 bulletins of Iran central insurance (identifies

with *INS*). As criteria, it indicates the level of development of private insurance and is measured as the ratio of premium to the GDP of particular district. Gini coefficient for the different districts is calculated by using detailed sampling of the statistical center of Iran for each region. This coefficient is shown with (*GI*).

This study uses the data of 11 districts ($N=11$) during 13 years ($T=13$) which cover all district of Iran from 2000 to 2012. Processing of panel data is lied in group of $T>N$ and the stationary and dependence condition of districts should be examined.

4. MODEL

In this stage, stationary examination will be done first. This examine has been adjusted based on Augmented Dickey Fuller test. The possibility of evaluation in heterogeneous conditions is the advantage of this examines comparing to the other ones.

$$\Delta y_{it} = \alpha_i + \beta_i y_{it-1} + \sum_{j=1}^k \gamma_{ij} \Delta y_{i,t-j} + \tau_i t + u_{it} \tag{1}$$

$$IPS = \frac{\sqrt{N}(\bar{t} - E(\bar{t}))}{\sqrt{var(\bar{t})}} \tag{2}$$

In above mentioned model, τ indicate trend and u_{it} as residual. IPS test presumes different districts are independent. However, in this study most probably the districts are dependent. For the dependency condition some special supplementary examinations have been designed such as Cross-section IPS named CIPS [Pesaran et al. \(2007\)](#). This test is applicable in case of $N>10$ and $T>N$ which are necessary conditions for data panel of this study.

$$CIPS = N^{-1} \sum_{i=1}^N h_i(N, T) \tag{3}$$

Which $h_i(N, T)$ is cross-section augmented Dickey-Fuller statistics.

Table-1. Panel Unit Root Test

Variables	IPS	CIPS
GI	-1.717	-1.948
GR	-2.274	-2.916
INF	-4.871	-4.921
INS	-2.646	-2.588
UE	-2.341	-1.961

Note: All statistics based on univariate AR(p) specification in the level of variable with $p=1$,
Author Own Calculation

As it has been shown in table 1, all variables being used in the study are stationary. The relation with specific $I(0)$ degree could be used for exploring the relation between insurance penetration and income distribution. The estimated relation will be specified as equation 4. Assuming homogenous or heterogeneous, model coefficient could be estimated in two versions as

random or fix coefficient. As various selected districts have considerable different income and insurance penetration, heterogeneous specification has been included in equation 4, although the FE estimate is being held in the model.

$$GI_{it} = \alpha_i + \beta_i INS + \gamma_i GR + \delta_i INF + \theta_i UE + u_{it} \tag{4}$$

β in the above mentioned equation, shows the relation of insurance penetration and income inequality which reaching to this relation is the aim of this paper. Based on Kuznets theory, the relation of economic growth and income inequality could be negative or positive which depends on development level of the country (or district) as per Shin (2012) for example Kefi and Zouhaier (2012) study showed bilateral and negative relation between growth and Inequality. In this study, dynamic panel data during 2000 to 2009 have been used. Some of studies like Heer and Sussmuth (2007) have indicated that the inflation and abrupt price change would affect income distribution. Currently Iran has one of the highest inflation rates in the world and has suffered from the chronic inflation for long years. In practice, formation of inflectional expectation affect meaningfully on the economic decisions. In this research, the relation between inflation and income distribution would be shown with (δ). Finally, according to Shin (2012), Unemployment variant has been added to the model so that the main effective factors on the income distribution (which have been available based on district data) would be considered alongside the insurance variant.

Table-2. Estimation of private insurance influence on income inequality

	FE		RC
GI(-1)	0.49	GI(-1)	0.398
GR	-0.062 (2.31)	GR	-0.305 (0.977)
INS	-0.024 (-1.84)	INS	-0.011 (-3.01)
INF	0.075 (2.01)	INF	0.167 (7.163)
UE	0.037 (1.806)	UE	0.07 (0.362)
R ²	0.853	R ²	0.823
F Sta.	50.02	F	139.01
LR test	265.37	Hau. Test	31.45

Note: t statistics in parentheses. (FE) fix effect and (RC) is random coefficient, (Hau.) is Hausman test. Author own calculation

As table 2 shows β is significant and negative in fix and random models. Economic growth as well as unemployment is negative and significant in FE model but insignificant in RC model. But in both models income inequality will be increased due to inflation.

In the next stage, the possible correlation between different districts has been examined by Brush-pagan LM test and Pearson CD test.

Table-3. Cross section dependence for panel data

Test	Statistics	p-value
LM	74.97	0.037
CD	4.49	0.001

Note: Null hypothesis is cross section independence, Author own calculation

As per the results of both above mentioned tests which summarized in table 3, different districts cannot be assumed to be independent of each other. Thus, the CIPS test which has been summarized in table (1) would be valid. As $E(u_{it}u_{jt}) \neq 0$ the residual covariance matrix will be estimated and used as weight for specifying the dependence between the districts. For this purpose, seemingly unrelated regression (SUR) method will be used. The specified research model is as equation (7).

$$GI_t = \alpha_t + \beta INS + \gamma GR + \delta INF + \theta GI_{t-1} + u_{it} \quad (5)$$

With respect to this model, β coefficient represents the relation between private insurance and income inequality among different districts of Iran. Negative coefficient confirms hypothesis of the research.

Table-4. Dynamic SUR estimation of private insurance on income inequality

	<i>Reg1</i>	<i>Reg2</i>	<i>Reg3</i>	<i>Reg4</i>	<i>Reg5</i>	<i>Reg6</i>
INS	-0.011 (-1.86)	-0.012 (-2.77)	-0.013 (-2.22)	0.0034 (0.87)	-0.021 (-1.99)	-0.011 (-2.01)
GR	0.043 (-2.11)	-0.037 (-1.98)	0.055 (-3.21)	0.025 (1.12)	0.071 (2.11)	-0.031 (-1.88)
INF	0.081 (4.47)	0.071 (3.93)	0.108 (2.22)	0.191 (1.51)	-0.051 (-0.66)	0.065 (1.99)
GI_{t-1}	0.362 (2.89)	0.272 (6.54)	0.696 (1.07)	0.116 (2.71)	0.415 (8.11)	0.408 (6.98)
	<i>Reg7</i>	<i>Reg8</i>	<i>Reg9</i>	<i>Reg10</i>	<i>Reg11</i>	<i>LM test</i>
INS	-0.009 (-2.49)	0.008 (0.78)	-0.010 (-2.92)	-0.022 (-3.56)	-0.002 (-0.62)	161.68
GR	-0.033 (-2.76)	-0.28 (-2.14)	-0.009 (-0.87)	-0.051 (-1.98)	-0.018 (-0.55)	
INF	0.090 (5.99)	0.023 (1.76)	0.044 (3.88)	0.035 (7.11)	0.066 (1.18)	
GI_{t-1}	0.558 (5.69)	0.313 (2.88)	0.411 (2.77)	0.510 (4.22)	0.331 (3.33)	

Note: t statistics in parentheses.
Author own calculation.

The result of SUR model estimation has been summarized in table (4). As been indicated, 9 districts out of 11 districts have negative β coefficient. In 8 districts this coefficient is significant at 5 percent level. Also, the relation of economic growth and income inequality shows income inequality will be reduced by economic growth; however the inflation and income inequality relation is positive. Although the insurance effect on the Income inequality is relatively lower than economic growth and inflation, the results are indicative of reducing effect of private insurance on the Income inequality. In the other words, development of private insurance in Iran will lead in reduction of income inequality.

5. CONCLUSION & DISCUSSION

The purpose of this paper is to answer the question whether the private insurances have any impact on income distribution? There are very few empirical studies in this area and most of studies have been focused on the impact of social insurances on income inequality. The main reason for this issue, is that private insurances have reached to their fullest extent in developed countries and in practice, analysis of their active role in the distribution of income could be effective only for the least developed countries. In a country like Iran, insurance penetration rate in 2002 was very low because of the changes that have occurred in the insurance industry. However,

insurance penetration is growing due to widespread privatization that has occurred in the insurance industry. That is why Iran economy can be a good place to check the main question of this research which is pursuing the role of private insurance on insurance penetration. Iranian provinces panel data has been collected for this purpose including economic growth, the Gini coefficient, insurance penetration rate and inflation in each of these provinces. The provinces have been divided into 11 regions and estimation of panel data regression has been presented. Data analysis revealed that economic growth or insurance penetration of any provinces can also be effective in income inequality of other provinces. Based on interaction of different levels of analysis, IPS and CIPS has been used to determine variables stationary and CD test has been used in the next stage to take account of this interaction.

With regard to the relations between sections, the panel estimation has been developed by using SUR Method. this method evaluates the relationship between sections in addition to estimating the relationships between variables in each sections. The estimation results show that the income inequality sections have been negatively affected by development of insurance penetration coefficient. Therefore, we cannot reject the hypothesis of relation between private insurance and income inequality.

As mentioned above, we have been able to study the impact of private insurance on macro economical variables due to the exceptional growth of insurance during the brief time. But as it is generally customary in insurance studies, the analysis can be applied in small communities. With consideration cultural and financial properties of Islamic countries, this paper suggest evaluation of *Takafol* (Islamic Insurance) effect on income distribution for the next study. *Takafol* penetration has been occurred mostly in the communities which have been dealt with financing of modern private insurances for not a long period of time. Thus the reducing effect of risk distribution on the income inequality can be studied in these areas.

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